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ABSTRACT

The items featured in this annotated bibliography touch on several aspects of the multifaceted class-size debate. Allen Odden reviews the literature and contends that class-size reduction should be used "sparingly and strategically." C. M. Achilles and colleagues examines two different class-size situations and find student test performance in the smaller classes is significantly better than in the larger ones. B. A. Nye and others describe the processes and results of three related longitudinal class-size initiatives. Douglas E. Mitchell and Sara Ann Beach review the history of class-size research, then pose and answer four questions relevant to policy issues or classroom practices. Tommy M. Tomlinson notes the political nature of the class-size debates. Helen Bain and others study the teaching practices and characteristics of 50 first grade teachers who participated in Tennessee's Student Teacher Achievement Ratio (STAR) Project. (MLF)

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# Class Size

*Siobhan Underwood and Linda S. Lumsden*

The debate surrounding class size and student achievement has inspired researchers to undertake numerous studies to determine whether smaller classes are truly more conducive to student learning. Despite extensive research, however, the results have been inconclusive.

Those on each side of the class-size debate argue that the data substantiate their respective positions. Thus, while many teachers claim the data support the notion that students learn more in smaller classes, many board members and administrators say the research supports their contention that class size would have to be cut drastically to have a significant effect on student achievement. They argue that class-size reduction of this magnitude would be prohibitively expensive.

The issue of class size is important to all those who have a stake in education. In addition to the potential effect of class size on student learning, teachers are also concerned with how class size affects their workloads and stress levels. Administrators are attentive to the impact of class-size decisions on budgets, facilities, and programs, while state and federal policy-makers are particularly interested in how class size affects overall education costs.

Although there is agreement in the educational community that classroom environment influences student learning, how that environment should be changed—if at all—is where teachers and administrators often come to an impasse. The items featured here touch on several aspects of the multifaceted class-size debate.

*Allen Odden* reviews the literature on class size and its relationship to student achievement and contends that class-size reduction should be used "sparingly and strategically."

*C. M. Achilles* and colleagues examine classroom conditions in a project that compared an elementary school with full Chapter 1 eligibility and another school in the same system that were similar in most respects except for class size.

*B. A. Nye, C. M. Achilles, J. B. Zaharias,* and *B. D. Fulton* describe the processes and results of three related longitudinal class-size initiatives—Tennessee's Student Teacher Achievement Ratio (STAR) Project, the Lasting Benefits Study (LBS), and Project Challenge.

*Douglas E. Mitchell* and *Sara Ann Beach* review the history of class-size research, then pose and answer four questions relevant to policy issues or classroom practices.

*Tommy M. Tomlinson* notes the political nature

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of the class-size debate and challenges many assumptions about class-size effects, based on the results of Tennessee's STAR Project.

*Helen Bain, Nan Lintz,* and *Elizabeth Word* studied the teaching practices, as well as the professional and personal characteristics, of 50 first-grade teachers who participated in the STAR Project and were deemed effective based on substantial gains made by their students in reading and math.

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Odden, Allan. **"Class Size and Student Achievement: Research-Based Policy Alternatives."** *Educational Evaluation and Policy Analysis* 12:2 (Summer 1990): 213-227. EJ 415 880.

In this review of research, Odden first discusses findings of Glass and Smith's 1978 meta-analysis of research on class size and student achievement (see *Research Roundup* 1:2, April 1985), calling it "the major research report around which class size policy issues have been debated during the 1980s." He also summarizes criticisms and re-analyses of Glass and Smith's findings.

"Research on class size and student achievement supports dramatic—and only dramatic—class size reductions," concludes Odden. He claims that "only when classes are reduced to 1-3 students—that is, a tutoring situation—do important achievement gains result." Smaller classes do, however, positively affect teachers' classroom attitude and behavior, giving them opportunities to engage in instructional strategies that research suggests can raise student performance.

Two powerful class-reduction strategies that can affect student achievement at the elementary level, particularly when used in tandem, are to provide individual or small-group tutoring for students who are achieving below grade level, and to institute class-size reductions (to 15), but only in language arts/reading instruction.

If these two strategies are combined with cooperative learning, peer and volunteer tutoring, computer-assisted instruction, and a rich curriculum that emphasizes thinking skills, even greater academic benefits can be obtained, says Odden, who notes that comprehensive staff development is required to ensure that such strategies are adopted.

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Achilles, C. M.; Kiser-Kling, Karen; Aust, Ann; and Owen, Jean. **Success Starts Small.** Final Report. Greensboro, North Carolina: University of North Carolina, 1994. 41 pages.

The study reported in this paper examined life in two different class-size situations to find out how teachers teach in the early grades. In one school, which had full Chapter 1 eligibility, the teacher/student ratio was about 1:15 in grades K-1-2. In the comparison school, the ratio was approximately 1:23. Both schools were in the same district, and classes were matched on nearly all variables except class size. Data were obtained through interviews, structured observations, and informal classroom visitations. Processes in the project schools were compared with other research, other small-class settings, and "regular" settings.

The smaller classes were characterized by high levels of task communication from teachers to individual students, smooth transitions, and minimal disciplinary problems. Student test performance in the smaller classes was significantly better than in the larger ones, although differences in classroom space and materials also had an impact on instructional effectiveness.

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Nye, B. A.; Achilles, C. M.; Zaharias, J. B.; and Fulton, B. D. **"Class-Size Research: From Experiment to Field Study to Policy Application."** Paper presented at the annual meeting of the American Educational Research Association, Atlanta, April 1993. 29 pages. ED 356 558.

This paper describes the methodology and results of three related class-size studies. The first, the Student-Teacher Achievement Ratio (STAR) Project, was a four-year longitudinal study in Tennessee that examined the effects of class size on student achievement in kindergarten through grade 3. More than 6,000 students from 75 schools in 42 systems participated.

Three class sizes were used in the study: small


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(13-17 students), regular (22-26 students), and regular classes with a full-time teacher aides. Students in the smaller classes improved more than those in larger classes, even with the presence of teacher aides, and improvements made in kindergarten were maintained through grade 3.

The Lasting Benefits Study (LBS) followed a sample of STAR students through grades 4 and 5 to determine if their early small-class involvement had any lasting effects. The study used student test scores and behavioral indicators as variables for analysis. The results were consistent: Students in the LBS study who had attended the small STAR Project classes outperformed students in the other two STAR groups in virtually every year in which achievement was compared. In addition, students who had been taught in the small grade 3 STAR classes were more advanced and had higher levels of participation than students who had attended the regular-size classes.

Tennessee's Project Challenge, the third study described in this paper, provided incentives for class-size reductions in 17 counties. Preliminary results indicate student gains in reading and math among project participants.

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Mitchell, Douglas, and Beach, Sara Ann. **How Changing Class Size Affects Classrooms and Students.** *Policy Briefs*, Number 12. San Francisco: Far West Laboratory for Educational Research and Development. 1990. 5 pages. ED 358 077.

In the first section of this policy brief, Mitchell and Beach review the history and evolution of class-size research from a period prior to the 1920s to the present. They then pose, and attempt to answer, four questions relevant to policy issues or classroom practices.

*How much, and how reliably, do class-size reductions lead to increased student achievement?*

Mitchell and Beach respond that achievement gains are reliable and can be regarded as "substantial" if reductions are continued through a student's 13-year career in the public school system.

*How does changing the student/teacher ratio influence student learning?*

The authors conclude that class-size reductions "improve attitudes and encourage the use of effective teaching techniques." In small classes, teachers tend to "interact more frequently with individual students and make substantive changes in classroom layout, student evaluation, and classroom management." Teachers of small classes in Tennessee, for example, report "less noise and misbehavior, more use of learning centers, more enrichment activities, more cooperation among students, and a better ability to evaluate student work effectively."

*What are the organizational and fiscal implications of class-size reduction?*

Mitchell and Beach note that while there is more than one way to estimate the cost of class-size reduction, even the most favorable cost estimates are "sobering." However, if schools are "willing to make schedules more complex and to use staff members more flexibly," they can reduce instructional group size without bringing in additional staff, and thereby lower costs.

*Can class-size reduction and desired achievement gains be accomplished without increasing the number of teachers and classrooms?*

The authors argue that class size can be reduced by redeploying staff members, redistributing students, and incorporating small-class instructional strategies into existing classrooms. As an example of staff redeployment, they cite an elementary school that "divides the school day to devote a three-hour block of time exclusively to instruction in the core academic subjects. During this period, all certificated staff take a class of about 15 students and instruction is protected from all interruptions. Assemblies, office announcements, and children changing classes occur only during the remainder of the day, when class size is allowed to rise to about 30 students."

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Tomlinson, Tommy M. **"Class Size and Public Policy: The Plot Thickens."** *Contemporary Education* 62:1 (Fall 1990): 17-23. EJ 431 934.

Tomlinson asserts that to make a real improvement in student achievement, class size has to be reduced so drastically that it is not financially feasible. He says virtually all research indicates that reducing class size by even a few students is very expensive and is unlikely to produce significant improvements in student learning. Tomlinson also contends that significant class-size reduction can have "unintended consequences," including exacerbation of the teacher shortage and decline in teacher quality as schools are forced to choose less competent teachers to fill a greater number of teaching positions.

Tomlinson critiques Indiana's PRIME TIME class-reduction project and Tennessee's Project STAR. Although he claims the costly PRIME TIME "has failed to meet an acceptable cost-benefit standard" in terms of student achievement, it persists, in part because teachers derive benefits from smaller class size.

Tomlinson contends that the "principal finding of Project STAR is not the size of the achievement yield, or enlightenment about the nature of effective in-

struction. Rather, it is the mundane substantiation of a class- size effect achieved under nearly ideal conditions." Noting that the participating teachers were all volunteers who strongly believed that smaller classes were better than larger classes, Tomlinson charges that they "appear to have done little to take advantage of the situation, hardly departing from their customary routine regardless of class size."

Both the capital and instructional costs of reduced class size, paired with insufficient evidence of the effects of class size on achievement, cause Tomlinson to conclude that pursuing such a course may not be justified.

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Bain, Helen; Lintz, Nan; and Word, Elizabeth. **A Study of First Grade Effective Teaching Practices from the Project STAR Class-Size Research.** July 1989. 37 pages. ED 321 887.

To better understand the qualities of effective teachers, Bain, Lintz, and Word interviewed and observed the professional and personal characteristics of 50 teachers who participated in Tennessee's Project STAR. The teachers were chosen because their classes' average gains in reading and mathematics ranked in the top 15 percent. Eight teachers had regular class sizes of 22-25 students, seven had intermediate class sizes of 18-21 students, and 23 had small classes of 13-17 students. Twelve had full-time aides.

The teachers demonstrated the following professional characteristics:

- High expectations for student learning;
- Clear, focused instruction;
- Close monitoring of student learning and progress;
- Use of alternative methods when students did not learn;
- Use of incentives and rewards when students did not learn;
- Efficiency in their classroom routines;
- High standards for classroom behavior; and
- Excellent personal interactions with students.

A common denominator among the teachers was their genuine love for children, which permeated their teaching. Praise for student success and enthusiastic demonstration of activities, combined with a sense of humor, were evident in all cases, regardless of class size. The researchers determined that these qualities, in addition to the reductions in class size, were in large part responsible for the teachers' success.

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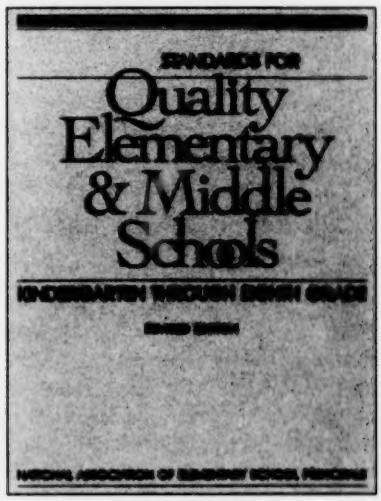


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